

WHAT IS CLAIMED is:

1. A semiconductor substrate comprising:  
a lightly doped substrate that contains impurities  
at a low concentration;

5 a heavily doped diffusion layer which is formed  
over a top of the lightly doped substrate and is higher  
in impurity concentration than the lightly doped  
substrate; and

an epitaxial layer which is formed over a top of  
10 the heavily doped diffusion layer and contains  
impurities at a lower concentration than the heavily  
doped diffusion layer.

2. A semiconductor substrate according to  
claim 1, wherein the impurities contained in the  
15 lightly doped substrate is phosphorous or boron.

3. A semiconductor substrate according to  
claim 2, wherein a resistance of the epitaxial layer is  
10  $\Omega\text{cm}$  or less.

4. A semiconductor substrate according to  
20 claim 2, wherein the lightly doped substrate, the  
heavily doped diffusion layer, and the epitaxial layer  
are of the same conductivity type.

5. A semiconductor substrate according to  
claim 2, wherein the lightly doped substrate and the  
25 heavily doped diffusion layer are of a first  
conductivity type, and the epitaxial layer is of a  
second conductivity type.

6. A method of manufacturing a semiconductor substrate comprising:

forming, on a surface of a lightly doped substrate that contains impurities at a low concentration, a  
5 heavily doped diffusion layer which is higher in impurity concentration than the lightly doped substrate;

mirror finishing a surface of the heavily doped diffusion layer; and

10 forming an epitaxial layer on the surface mirror finished of the heavily doped diffusion layer, the epitaxial layer containing impurities at a lower concentration than the heavily doped diffusion layer.

7. A method of manufacturing a semiconductor substrate comprising:  
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mirror finishing a surface of a lightly doped substrate that contains impurities at a low concentration;

forming, on the surface mirror finished of the  
20 lightly doped substrate, a heavily doped diffusion layer which is higher in impurity concentration than the lightly doped substrate; and

forming an epitaxial layer on a surface of the heavily doped diffusion layer, the epitaxial layer  
25 containing impurities at a lower concentration than the heavily doped diffusion layer.

8. A method of manufacturing a semiconductor

substrate comprising:

forming, on top and back of a lightly doped substrate that contains impurities at a low concentration, heavily doped diffusion layers which are  
5 higher in impurity concentration than the lightly doped substrate;

removing the heavily doped diffusion layer which is formed on one of the top and back of the lightly doped substrate;

10 mirror finishing a surface of the heavily doped diffusion layer which is formed on the other of the top and back of the lightly doped substrate; and

forming an epitaxial layer on the surface mirror finished of the heavily doped diffusion layer, the  
15 epitaxial layer containing impurities at a lower concentration than the heavily doped diffusion layer.

9. A method of manufacturing a semiconductor substrate comprising:

forming, on the top and the back of a lightly  
20 doped substrate that contains impurities at a low concentration, heavily doped diffusion layers which are higher in impurity concentration than the lightly doped substrate;

dividing the substrate into divided substrates by  
25 cutting it along a surface thereof at a center in a thickness direction;

planarizing a cut surface of each of the divided

substrates;

mirror finishing a surface of the heavily doped diffusion layer which is formed on each of the divided substrates; and

5           forming an epitaxial layer on the surface mirror finished of the heavily doped diffusion layer on each of the divided substrates, the epitaxial layer containing impurities at a lower concentration than the heavily doped diffusion layers.

10           10. A semiconductor substrate comprising:

          a heavily doped diffusion layer which is formed over a top of a lightly doped substrate and is higher in impurity concentration than the lightly doped substrate, the lightly doped substrate being removed at  
15           a final stage of a process; and

          an epitaxial layer which is formed over a top of the heavily doped diffusion layer and contains impurities at a lower concentration than the heavily doped diffusion layer, wherein an impurity diffusion  
20           layer for forming a semiconductor device is formed in the epitaxial layer.

          11. A semiconductor substrate according to claim 10, wherein a resistance of the epitaxial layer is 10  $\Omega$ cm or less.

25           12. A semiconductor substrate according to claim 10, wherein the lightly doped substrate, the heavily doped diffusion layer, and the epitaxial layer

are of the same conductivity type.

13. A semiconductor substrate according to claim 10, wherein the lightly doped substrate and the heavily doped diffusion layer are of a first conductivity type, and the epitaxial layer is of a second conductivity type.

14. A method of manufacturing a semiconductor substrate according to claim 6, wherein the method further comprises forming in the epitaxial layer an impurity diffusion layer for forming a semiconductor device, and removing the lightly doped substrate at a final stage of a process of forming the semiconductor substrate.

15. A method of manufacturing a semiconductor substrate according to claim 7, wherein the method further comprises forming in the epitaxial layer an impurity diffusion layer for forming a semiconductor device, and removing the lightly doped substrate at a final stage of a process of forming the semiconductor substrate.

16. A method of manufacturing a semiconductor substrate according to claim 8, wherein the method further comprises forming in the epitaxial layer an impurity diffusion layer for forming a semiconductor device, and removing the lightly doped substrate at a final stage of a process of forming the semiconductor substrate.

17. A method of manufacturing a semiconductor substrate according to claim 9, wherein the method further comprises forming in the epitaxial layer an impurity diffusion layer for forming a semiconductor device, and removing the lightly doped substrate at a final stage of a process of forming the semiconductor substrate.